24393

OTS: 60-11,445

JPRS: 2444

28 March 1960

SOVIET ABSTRACTS
BIOLOGY

SECTION I - PLANT PHYSIOLOGY

Book No. 2, 1959

Abstracts 5957 thru 6022

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42nd STREET, SUITE 300
NEW YORK 17, N. Y.

JPRS: 2444

R-2451-N/I

SELECTED TRANSLATIONS OF

ABSTRACTS IN REFERATIVNYY ZHURNAL - BIOLOGIYA, No. 2, 1959

This report consists of complete translations of the Russian-language abstracts of articles, which were originally published in the Sino-Soviet bloc and in Yugoslavia.

The subject classification system used in the Russian-language abstracts has been followed in this publication.

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5957.

Author : Vasil'yeva, L. A.
Inst : Moldavian Affiliate of the Academy of Sciences USSR.
Title : Some Biochemical Processes in Apple-Tree Leaves Under Various Growth Conditions.

Orig Pub: Izv. Mold. fil. AN SSSR, 1957, No 6, (39), 33-55.

Abstract: In the years 1952 through 1954 investigation of seven varieties of apple trees grown in the southern Dnepr River areas (flooded orchards) and in the Kodry hills (a non-irrigated plot), were carried out as to the water content and leaf composition of the middle layer of fruit shoots of the outer part of the southeastern exposure of the

Card 1/3

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5957.

Abstract: tree top. In the course of vegetation a decrease of the water-retaining ability of tissues occurs (taking into account the water loss per unit after saturation of the leaf surface for 30 minutes at 30°) and a lowering of the protein content under intensification of the hydrolytic activity of proteases. The water content decrease contributed to a lowering of the ascorbic acid content, to an increase in the activity of oxidizing ferments (polyphenol oxidase and ascorbic oxidase), to an increase in the respiration rate, to an increase of soluble carbohydrates and starch contents, and to a rise in the ratio of sucrose to monose. According to the degree of aging, especially in early-ripening varieties, a

Card 2/3

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5957.

Abstract: decrease in the ascorbic oxidase activity was observed, and in the Kodry hills, a decrease in polyphenol oxidase activity was also observed. The ascorbic acid content as well as the hydrolytic activity of invertase and amylase, after a decrease from May to June, rose earlier among summer varieties found in the Kodry hills. The bibliography lists 41 titles. -- B. Ye. Kravtsova.

Card 3/3

CZECHOSLOVAKIA / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5966.

Author : Kaldy, A.; Zubricky, J.
Inst : Not given.
Title : The Carotene Content of Barley During Germination.

Orig Pub: Veterin. casop., 1958, 7, No 1, 80-88.

Abstract: Barley was germinated under various light exposures. The carotene content increased during germination up to the time when the leaf tips began to turn brown. The greatest carotene content was observed under natural light exposure, while lesser and least carotene contents were

Card 1/2

CZECHOSLOVAKIA / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5966.

Abstract: observed under exposure to heating lamps, and to dark exposure, respectively. The carotene content was higher at a temperature of 16 - 18° than at a temperature of 6 - 7°.

Card 2/2

CZECHOSLOVAKIA / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5967.

Author : Sestak, Zdenek.
Inst : Not given.
Title : Paper Chromatography of Plastid Pigments.

Orig Pub: Ceskosl. biol., 1958, 7, No 2, 153-159.

Abstract: No abstract.

Card 1/1

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5973.

Author : Ekster, Ya. E.
Inst : Odessa Agricultural Institute.
Title : The Interrelation of Oils and Tannic Acids Content in Grape Seeds.

Orig Pub: Tr. Odessk. s.-k. in-ta, 1957, 8, 89-92.

Abstract: The author attributes a frequently observed reversible dependence of oils and tannic acids in grape seeds to their common carbohydrate origin. The tannic acids contained in grapes are classified into two groups: a) esters of aromatic oxycarbonic acids (gallic and protocatechuic acids), and b) condensed tannic acids not possessing an ester character [catechin and gallo-catechin]. Substances of the first group are undoubtedly de-

Card 1/2

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5973.

Abstract: rived from carbohydrates in as much as many of them represent complex esters of glucose and tannic acid. The carbohydrate origin of aromatic compounds, entering into the composition of tannic acids of both groups, is indicated through the formation of polyphenols, entering into the composition of tannic acids from carbohydrates. The hypothesis linking the formation of polyphenols with the photosynthesis process has not been confirmed, so that the synthesis of tannic acids in plants can also occur in the absence of light. Schemes are cited as to the formation of glycerine and the simplest polyphenols from carbohydrates. -- P. Ye. Tsekhmistrenko.

Card 2/2

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5974.

Author : Vereshchagin, A. G.
Inst : Not given.
Title : Fat Metabolism in Plants.

Orig Pub: Uspekhi sovrem. biol., 1958, 45, No 1, 114-129.

Abstract: A survey of experimental data in the sphere of fat metabolism investigations of plants during the last 20 to 25 years is presented. Considered are: characteristics of fat metabolism in plants as compared with fat metabolism in other organisms; fat metabolism in germinating olive seeds from the point of view of gas exchange, intermediate products, and ferment systems participating in the process; problems of fat formation in ripening seeds; the role of mineral elements and

Card 1/2

USSR / Plant Physiology. Respiration and Metabolism. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5974.

Abstract: some vitamins in plant fat metabolism as well as the existing presentation of the mechanism of fatty acids formation in plants. Bibliography. 152 Titles. -- A. G. Vereshchagin.

Card 2/2

USSR / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5985.

Author : Maksimovich, A. Ye.; Okanenko, A. S.; Bakhir, A. I.
Inst : AS USSR.
Title : Some Mechanisms in the Storage of Root Nutritional Elements in Sugar Beets.

Orig Pub: V sb.: Pamyati akad. N. A. Maksimova, M., AN SSSR, 1957, 257-267.

Abstract: Sugar beets were grown in Kiev under conditions of soil cultures, as a vegetation experiment, and under field conditions. In experiments where N was applied in the form of NO_3, in the first vegetation phases and in the period of intensive growth, the ratio of the sum of cation milliequivalents to the sum of N, P, S, and Cl milli-

Card 1/2

USSR / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5985.

Abstract: equivalents amounted to 0.92 - 1.12. In cases of growth retardation, the ratio increased and towards the end of the vegetation reached 1.08 - 1.31. Such an increase was observed under conditions of insufficient N supply to the plants and the lack of other nutrient substances. A better N supply preserved the value of the ratio (K/ Na/ Ca/Mg) : /N/P/S/Cl7 at a level of approximately 1.00 (0.92 - 1.22). Moreover, the weight of the roots increased. Substitution of nitrate N with ammonium N was not reflected in the value of the ratio under consideration, which was explained, obviously, by nitrification with ammonium nitrogen. -- Ye. A. Yablonskiy.

Card 2/2

CZECHOSLOVAKIA / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5986.

Author : Setlik, Ivan.; Trnkova, Aleska.
Inst : Not given.
Title : Absorption of Phosphoric Acid Ions Through the Surface of Leaves.

Orig Pub: Preslia, 1957, 29, No 4, 337-348.

Abstract: The rate of P^{32} intake by plants, deposited on leaves of cultivated geranium in the form of $KH_2P^{32}O_4$ solutions and the infusion of the labelled super-phosphate, was studied. The experiments were carried out with loose leaves and with the intact plant. The loose leaves were immersed by their petioles into Knop's solution. The rate of intake was judged by the radioactivity of the

Card 1/3

CZECHOSLOVAKIA / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5986.

Abstract: microscopic sections of the leaf blade made with the aid of a freezing microtome. Within four to seven days the radioactivity of all the layers of the leaf blade levelled off. The rate of P transfer increased when the solution contained 1% gelatin or 2% agar-agar. Among the moistened leaves P moves with the greatest speed in young top leaves, and with the slowest speed in old bottom leaves. In experiments, applying labelled phosphate solutions to leaves of young sugar beet plants /weight of roots was 60 grams/, the P^{32} transfer was studied, with the aid of radioautographs, in thin sections of leaves and petioles, and in longitudinal and transverse sections of the roots. The radioactivity of the roots became

Card 2/3

CZECHOSLOVAKIA / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5986.

Abstract: significant after one day, following the moistening of the leaves, and increased by the 4th or 5th day. The radioactivity of petiole sections was greatest on the 3rd and 4th day after moistening of the leaves. The work was carried out at the Karlov Institute. Bibliography. 29 Titles. -- D. M. Grodzinskiy.

Card 3/3

CHINA / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5990.

Author : Lei Hung-Shu.
Inst : Not given.
Title : Phosphorous Nutrition in Plants.

Orig Pub: Chih-wu sheng-li-hsueh t'ung-hsun, 1958, No 1, 1-14.

Abstract: No abstract.

Card 1/1

USSR / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5993.

Author : Baykova, V. M.
Inst : Petrozavodsk University.
Title : The Action of Microquantities of Copper and Manganese on Physiological Processes in Corn.

Orig Pub: Sb. nauchn. rabot stud. Petrozavodskogo un-ta, 1957, vyp. 4, 96-110.

Abstract: Corn seeds were soaked for 12 hours in 0.01% and 0.1% solutions of $CuSO_4$ and $MnSO_4$, respectively, as well as in distilled water. Dry seeds served as control samples. Sowing was carried out the following day after soaking. Seeds treated with microquantities of copper and manganese, respectively, germinated two days earlier than those soaked in water. Plant development was ac-

Card 1/2

USSR / Plant Physiology. Mineral Nutrition. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5993.

Abstract: celerated by $MnSO_4$ and inhibited by $CuSO_4$. Using the $MnSO_4$ modified treatment, the corn cobs were more numerous both in quantity and total weight. The greatest content of vitamin C and carotene in leaves was also observed in plants using this very same modification. The treatment of seeds with microquantities of elements increased the carbohydrate content in leaves and stems of plants. Treatment with $MnSO_4$ effected the maximum increment of the green-mass crop (as compared with water soaking, an increment of 95.26%). -- Ye. A. Yablonskiy.

Card 2/2

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5998.

Author : Sutulov, A. N.
Inst : AS USSR.
Title : The Swelling Phenomenon in Seeds.

Orig Pub: V sb.: Pamyati akad. N. A. Maksimova, M., AN. SSSR, 1957, 167-172.

Abstract: The volume swelling in water of dead seeds of various plants increased more rapidly than that of live seeds. The abnormally strong swelling (dilation), caused by the high temperature, lead to a significant increase in the permeability of the protoplasm. In corn seeds swollen in water for 48 hours at 20°, the wash-out ability of substances, as determined with the aid of an inter-

Card 1/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5998.

Abstract: ferometer, remained low (1.81 - 2.57), but germination was retained. Swelling at 50° led to a complete loss of seed germination and to a sharp permeability increase [13.4 - 15.9] with posthumous swelling. With the aid of the nitro prussic reaction, CH-groups were located in wet corn seeds at 20°, whereas at 50° they disappeared. Conclusions are drawn to the effect that seed destruction is attributed to the oxidation of SH groups to -S-S- groups. The intensification of oxidative processes, caused by the high temperature, raised the protoplasm permeability, lowered the hydration extent of colloids (their hydrophilic nature), and the water retaining ability of tissues. The intercellular spaces were filled as a

Card 2/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5998.

Abstract: result and the seeds entered a swollen state indicating an irreversible loss of germination. The work was carried out at the Scientific Research Institute of the Starch Molasses industry. Bibliography contains 15 titles. -- Ye A. Yablonskiy.

Card 3/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6001.

Author : Travkin, M. P.
Inst : Main Botanical Garden, AS USSR.
Title : Storage of Sprout-Inhibiting Substances in Seeds of Reduced Germination Abilities.

Orig Pub: Byul. Gl. botan. sada. AN SSSR, 1957, vyp. 29, 78-80.

Abstract: Batches of seeds (of five grams each) having different germinating abilities were extracted with 50 ml. of distilled water for 24 hours with subsequent filtration of the seeds. As a test item, seeds of spring wheat of the Lutescens 62 variety with a germination ability of 93% and a high sprouting energy were used; they were soaked in an extract for 24 hours and germinated on wet filter

Card 1/2

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6001.

Abstract: paper in Petri dishes. Extracts of seeds of reduced germinating abilities strongly inhibited the sprouting of wheat seeds. The inhibitory action of extracts of old seeds was stronger than that of fresh seeds. Extracts of fresh seeds of phacelia, millet, lupine and tomatoes almost did not contain inhibitory substances. Extracts of timothy and onion seeds showed distinct inhibitory action. -- Ye. A. Yablonskiy.

Card 2/2

POLAND / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6002.

Author : Blaim, K.
Inst : Not given.
Title : Biochemical Germination Regulators of Seeds. Part II. Germination Activators of Seeds.

Orig Pub: Postepy nauk roln., 1956, 3, No 3-4, 125-130.

Abstract: No abstract.

Card 1/1

CHINA / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6007.

Author : Lo Shih-Wei.
Inst : Not given.
Title : Cultivation of Plant Tissues.

Orig Pub Chih-wu sheng-li-hsueh t'ung-hsun, 1957, No 6, 14-17.

Abstract: No abstract.

Card 1/1

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6019.

Author : Yevtushenko, G. A.
Inst : Institute of Botany, AS Kirghiz SSR.
Title : Photoperiodism of Wild Species of Tobacco.

Orig Pub: Tr. In-ta botan. AN KirgSSR, 1958, vyp 3, 149-184.

Abstract: Investigations of three kinds of illumination were carried out in Krasnodar and thereafter in Frunze; they were as follows: a short 9-hour day, a natural 15-16 hour day and continuous illumination. Of the 14 wild species investigated, 10 were shown to be of the long-day variety, three (N. rusbyi, N. paniculata and N. augustifolia), of the short day variety, but N.

Card 1/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6019.

Abstract: glutinosa reacted poorly to the change in the length of day. Plants of N. rusbyi under conditions of continuous illumination remained in the vegetative state up to the end of the vegetation period (212 days from germination). N. sylvestris, N. plumbogenifolia, N. langsdorfii under conditions of the short day did not proceed to bloom even in the second vegetation year. The remaining species budded and blossomed under unfavorable light conditions, but at much later dates. For N. rusbyi and N. sylvestris the 12-hour day light period appears to be critical /some of the plants bloom, while others do not/. The author proposes to utilize the plants grown under critical light periods for the selection of

Card 2/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6019.

Abstract: the necessary forms. Rosette forms are observed only with long-day species. -- P. I. Gupalo.

Card 3/3

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6020.

Author : Modilevskiy, Ya. S.
Inst : Not given.
Title : Ontogeny of the Higher Plants and the Theory of Stage Development.

Orig Pub: Ukr. botanichniy zh., 1958, 15, No 1, 3-21.

Abstract: Based on previously published cytoembryonological studies which he has made, as well as on the data of other investigators, the author advances a concept of four ontogenetic stages in the higher plants. 1. The protoembryonic stage exclusively in the aging maternal organism and simultaneously the preliminary stage for the nascent organism; it is characterized by cell rejuvenation at the growing points before sporogenesis. 2. The first

Card 1/2

USSR / Plant Physiology. Growth and Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6020.

Abstract: embryonic stage is the beginning of development in the endosperm and body of the embryo up to the transition toward the formation of the growing point; the embryo cannot sprout. 3. The second embryonic stage is the development of the vegetative cone in the embryo and emergence of the capacity to assume an independent state. 4. The ecologico-adaptive stage appears in the form of vernalization and the so-called photoperiodic stages, as well as in other variations which have not yet been studied, such as the xerophilic phase in plants of the monsoon forests in the tropics. The bibliography lists 47 titles. -- P. I. Gupalo.

Card 2/2

RUMANIA / Plant Physiology. Growth Development. I

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6022.

Author : Lazarescu, C.
Inst : Not given.
Title : Contemporary Discussions on the Theory of Plant Stage Development.

Orig Pub: Rev. Padurilor, 1958, 72, No 3, 158-159.

Abstract: No abstract.

Card 1/1

#1471

END

This publication was prepared under contract to the
UNITED STATES JOINT PUBLICATIONS RESEARCH SERVICE,
a federal government organization established
to service the translation and research needs
of the various government departments.